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Just what can be accomplished there remains to be seen, for it is plainly useless to plant monuments on moving glaciers.

Toward the north, in the land of the Midnight Sun, the transit line has crossed a range of mountains whose crests are estimated to be about 7,000 feet high, distant about twenty miles from the coast. The last station is about seven miles from the Arctic Ocean. The topography, triangulation, and monumenting have not been finished quite so far, and the details of this work are not yet at hand, as the parties are only just returning after a very successful season. The season was marred only by an outbreak of smallpox among the Indians which, as a matter of self-protection as well as for humanitarian reasons, engrossed the care and attention of the American Chief Engineer and his surgeon all summer.

The Survey is giving special attention to the publications, for the use of engineers, of the geographic coördinates, the descriptions of the trigonometric stations, and the leveling and magnetic results. The daily mail at the Survey office impresses one with the widespread and increasing demand for this information, and taxes the ability of the office to keep pace with it. Each division is in charge of an expert and the result is that the methods of the Survey compel the close attention and study of other nations and often serve as a model for them.

INVESTIGATION OF ILLINOIS SOILS

BY

CYRIL G. HOPKINS

The Agricultural Experiment Station of the University of Illinois has been engaged in the investigation of Illinois soils for about ten years. These investigations are conducted by soil surveys, by analyses of representative samples of the various types of soil found in the State, and by culture experiments which are carried on to some extent by pot cultures in glass houses, in large jars filled with different types of soil treated and cropped in different ways, and much more extensively by field experiments which are in progress on thirty-five different soil experiment fields, aggregating about 800 acres of land on representative soils in various parts of the State.

A general soil survey of the entire State was first made in which fourteen great soil areas were located, based upon soil formations, and one or more of the most important soil types found in these areas were investigated by ascertaining the stock of fertility contained in the soil and the results in culture experiments where deficient fertilizing materials were applied to the land. In this way much information was secured relating to twenty-five of the most important and most extensive types of soil in Illinois. This general soil survey has been followed by a detailed soil survey in which every type of soil on every man's farm is found and the boundary lines located on an accurate map.

This detailed soil survey is conducted by the State of Illinois without coöperation with the United States Department of Agriculture, and it has already covered thirty-seven counties, or more than one-third of the entire State. The publication of the detailed soil maps has been intentionally delayed in order that the chemical analysis, showing the total stock of fertility in each type of soil, might be completed, and more particularly in order that several years' results from actual field investigations might be included in the report in order to give it value and to carry conviction to the farmers and landowners concerning the importance and possibility of different methods of soil improvement.

The publication of these reports is now in progress. Report No. 1, "Clay County Soils," and Report No. 2, "Moultrie County Soils," have already been published and distributed. Clay County is one of the representative counties of a great area in Southern Illinois, known as the wheat and fruit belt, while Moultrie is a typical corn-belt county of the central part of the State.

An attempt was made ten years ago to coöperate with the United States Bureau of Soils in the detailed soil survey of Illinois, but the methods of surveying followed by the Bureau were so general and superficial in character that the work proved altogether unsatisfactory both to the Illinois Experiment Station and to the practical and progressive farmers of the State. A report of this coöperative report of Clay County, Illinois, was published in connection with the "Field Operation of the Bureau of Soils, 1902," reference to which shows that all of the upland soils of the county, aggregating about 85 per cent. of the total area, are classified as one type of soil, while Soil Report No. 1, "Clay County Soils," published by the University of Illinois Agricultural Experiment Station, March, 1911, shows eleven different types of upland soil. In a word, the report issued by the United States Bureau of Soils tells what crops are commonly grown in the county and gives soil analyses showing only the percentages of sand, silt, and clay, with no information concerning the stock of fertility; while the report published by the University of Illinois gives the total stock of every important element of fertility in every type of soil and also gives the results obtained from the addition of different kinds of fertility in different forms, especially in the most economical and profitable forms for use in permanent systems of soil improvement, including farm manures and the use of leguminous crops (which constitute the farmers' natural means of securing nitrogen from the inexhaustible supply in the air), ground natural limestone (which is not caustic in its action, does no damage to the soil, and which is the most economical form of lime to use in normal conditions), and either steamed bone meal (originally a farm product) or fine-ground natural rock phosphate, a still more economical form of phosphorus, which can be secured at sufficiently low prices from the nearby deposits in Tennessee to enable Illinois farmers and landowners positively to enrich their soils in that very important element. Magnesium is also supplied in natural dolomitic limestone, and potassium is liberated from the soil where the natural supply is essentially inexhaustible; or on certain abnormal soils, such as peaty swamp land, soluble potassium salts are used with large profit.

Several additional county soil reports are now in process of preparation, printing or lithographing, and hereafter the publication of the reports is expected to keep pace with the survey, which it is hoped will cover the remainder of the State within the next ten or twelve years.

SCOTT'S SECOND ANTARCTIC EXPEDITION*

BY

EDWIN SWIFT BALCH

On March 31, 1912, the *Terra Nova* returned to Akaroa, New Zealand, from her relief voyage to Captain Robert Falcon Scott's expedition in East Antarctica. The *Terra Nova* thus has come out of the Antarctic ice later than any ship heretofore, so late in fact that some students of Antarctic conditions had given up expecting her home this year. She brings back important news of Scott's work, and although the results can hardly be analyzed as yet ex-

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The *Bulletin* has not printed an Antarctic chart with Mr. Balch's papers on the Amundsen and Scott Expeditions because it will not be possible to indicate their routes and the position of their discoveries till their maps are published. It is suggested that readers of these papers consult, for purposes of orientation, Antarctic charts such as are found in the last edition of the Century Atlas (Sheet 3½) or the charts in the Stieler, the Andree, and the E. Debes Atlases.